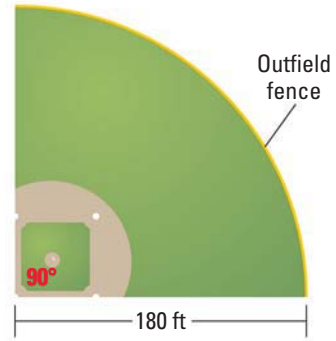




EXAMPLE 4 TAKS REASONING: Multi-Step Problem

SOFTBALL A softball field forms a sector with the dimensions shown. Find the length of the outfield fence and the area of the field.



Solution

STEP 1 Convert the measure of the central angle to radians.

$$90^\circ = 90^\circ \left(\frac{\pi \text{ radians}}{180^\circ} \right) = \frac{\pi}{2} \text{ radians}$$

STEP 2 Find the arc length and the area of the sector.

$$\text{Arc length: } s = r\theta = 180 \left(\frac{\pi}{2} \right) = 90\pi \approx 283 \text{ feet}$$

$$\text{Area: } A = \frac{1}{2}r^2\theta = \frac{1}{2}(180)^2 \left(\frac{\pi}{2} \right) = 8100\pi \approx 25,400 \text{ ft}^2$$

► The length of the outfield fence is about 283 feet. The area of the field is about 25,400 square feet.

AVOID ERRORS

You must write the measure of an angle in radians when using the formulas for the arc length and area of a sector.

GUIDED PRACTICE for Example 4

9. **WHAT IF?** In Example 4, estimate the length of the outfield fence and the area of the field if the outfield fence is 220 feet from home plate.

13.2 EXERCISES

HOMEWORK KEY

- = WORKED-OUT SOLUTIONS on p. WS1 for Exs. 11, 23, and 51
- = TAKS PRACTICE AND REASONING Exs. 14, 31, 50, 53, 55, and 56

SKILL PRACTICE

- VOCABULARY** Copy and complete: An angle is in standard position if its vertex is at the ? and its ? lies on the positive x -axis.
- WRITING** How does the sign of an angle's measure determine its direction of rotation?

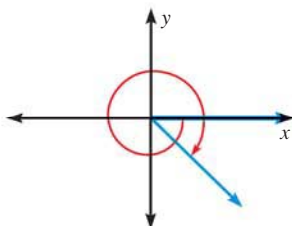
VISUAL THINKING Match the angle measure with the angle.

3. -240°

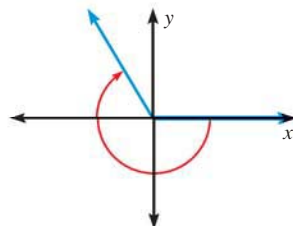
4. 600°

5. $-\frac{9\pi}{4}$

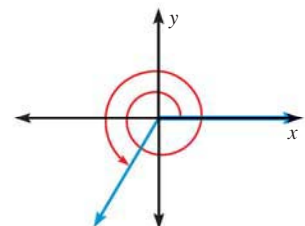
A.



B.



C.



EXAMPLES 1 and 3

on pp. 859–861 for Exs. 3–14